REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. Rejection of Claim 72 and 74-75 under 35 U.S.C. §112, second paragraph.

Claims 72 and 74-75 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. In particular, the Examiner stated that it was "not clear whether this is the same 'second drying zone' of the parent claim." In response, the Applicant has amended Claim 72 and 74-75 to overcome the rejection.

2. Rejection of Claims 31-80 under 35 U.S.C. § 103(a).

There appears to be some confusion regarding the structure and function of the applicants claimed invention and the functional components of the Oates and Lockwood references. Consequently, the combinations suggested by the Examiner do not contain all of the structural or functional limitations of the claims and a prima facie case of obviousness under Section 103 has not been made. The claims are not obvious in view of the cited references because the proposed combinations would render the prior art unsatisfactory for its intended purpose; would change the principle of operation of the references and the combinations do not teach all of the claim limitations.

The basic requirements of a *Prima Facie* case of obviousness are found in MPEP §2143, which provides:

> "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, *there must be some suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, *to modify the reference or to combine reference teachings*. Second, there must be a *reasonable expectation of success*. Finally, the prior art reference (or references when combined) *must teach or suggest all the claim limitations*...The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." (emphasis added)

Regarding suggestion or motivation to combine references, MPEP§ 2143.01 provides:

> "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. 'The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.' *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000)."
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> ...
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> "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)..." Id.

If the proposed combination or modification of the Examiner would make the prior art invention being modified unsatisfactory for its intended purpose then there is no incentive, suggestion or motivation to make the combination. MPEP §2143.01(V) states:

> "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)" (emphasis added)

Likewise, if the proposed modification or combination would change the functional principles of operation of the prior art reference being modified there is no incentive, suggestion or motivation to make the combination. MPEP §2143.01(V) states:

> "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)."

A *prima facie* case of obviousness has not been stated in the present case because the combinations put forward by the Examiner do not have all of the elements and limitations of the claims; change the principles of operation of the references and render the prior art inventions unsatisfactory for their intended purposes. As described below, there is no incentive, suggestion or motivation to combine the Oates and Lockwood references in a manner stated by the Examiner. These references approach dehydration in different ways and the jet engine is not the functional equivalent to either a blower in the fluid bed of Oates or a source of ultrasound.

A. **Rejection of Claims 31-33, 38-39, 59-61, 69-70, 73-74 and 77-79 under 35 U.S.C. § 103(a) Oates in view of Lockwood**

Claims 31-33, 38-39, 59-61, 69-70, 73-74 and 77-79 were rejected under 35 U.S.C. § 103(a) as being obvious over *Oates* (U.S. No. 3,214, 844) in view of *Lockwood* (U.S. No. 4,334,366). Initially, the combination of Oates and Lockwood does not have all of the limitations of the claims as required. (See MPEP §706.02(j) and MPEP§2143). In particular, the combination of these references does not have 1) ultrasound, 2) a support substrate (granular support media) or 3) the temperature and airflow limitations in the dependent claims.

1. A Pulse Jet Engine Is Not A Source Of Ultrasound.

In support of the rejection, the Examiner states: "Lockwood teaches a drying apparatus comprising an ultrasound source (column 5, line 60 to column 6, line 18)" and "Furthermore, Lockwood describes the frequency as being 'several thousand cycles per second' (column 5, line 65). Ultrasonic waves were conventionally considered to be on the order of 20,000 cycles per second. Therefore, Lockwood clearly teaches an ultrasonic source."

The Applicant respectfully disagrees with this conclusion. Lockwood does not teach an ultrasonic source. The jet engine is a source of sound or sonic waves not a source of ultrasonic waves. Sound waves are defined in the art as having a frequency of between approximately 2 kHz and less than 20 kHz. Ultrasonic waves, on the other hand, have a frequency range of 20 kHz or greater and is not audible to the human ear. Accordingly, the Lockwood patent accurately identifies the sound coming out of the jet engine as having a frequency of "a few thousand hertz." However, the Lockwood reference does not disclose ultrasound, as defined in the art. Disclosing sound waves does not disclose ultrasound any more than referencing a flashlight beam would disclose an infrared and ultraviolet source. The high-energy sound waves provide physical effects that are different than ultrasound or a fluid bed and therefore a different method of dehydration than described by Oates or the Applicant as described below.

Accordingly, the combination of Lockwood and Oates does not disclose an "ultrasound source," and there is no suggestion, incentive, motivation or teaching found in either Lockwood or Oates to provide an ultrasound source. Therefore the rejection should be withdrawn on this basis alone.

2. The Combination Does Not Have A (Granular) Support Substrate

The language of the claims regarding a "support substrate" has been given a number of interpretations by the Examiner during prosecution and so Claim 31 has been amended to recite "a bed of granular support media." The support substrate does not need to be spherical as provided in the dependent claims, but can be many different geometric shapes. The granular support substrate permits control over the drying conditions so that the temperature and air flow volume can be greatly reduced over what is required by Oates and Lockwood and other dryers in the art. These drying conditions permit the Applicant to dry materials that spoil, burn or otherwise cannot be dehydrated by Oates, Lockwood or other machines in the art.

3. The Claimed Air Flow and Temperature Ranges Are Significant

The Examiner stated, "Phrases such as 'at a rate of between...' are merely preferred methods of using the claimed apparatus." The Applicant disagrees and submits that the claimed invention overcomes the limitations of the evaporative fluid bed of Oates and the compression impact method of Lockwood that cannot operate with the claimed temperature and airflow rates. This invention allows unique drying conditions and therefore the characteristics of the dried material may be different from those seen with a fluid bed.

One disadvantage of fluid beds is that they require a threshold quantity of air directed through the bed at or above a threshold velocity in order for the apparatus to function. If the airflow is below the velocity and volume thresholds, then the material to be dried will not become airborne and the material will clump and will not dry properly or at all. Accordingly, there is a size and weight limitation in the type of material that can be dried in a fluid bed. For example, large material such as meat chunks or very fine particulate materials cannot be used with a fluid bed.

In contrast, the present invention does not have these threshold limitations and the airflow velocity and volume are about three times less than the requirements of a typical fluid bed as disclosed in Scott or Oates. Lockwood discloses substantially higher flows due to the nature of a jet engine. The Oates fluid bed patent discloses flow rates of 800-900 to 3500 feet per minute and the flow rate of Lockwood is limited to the range of discharge from the size of jet engine selected. However, these flow rates are substantially higher than the rates recited in the Applicant's claims that are configured to force heated air through the conveyor and the support substrate without setting the substrate and material to be dried in motion. The approach of the Applicant is a significant benefit over the art because the total volume of heated air that is required is substantially less than what is required for a fluid bed.

In addition, with fluid beds, the direction of the airflow must be from below and through the perforated table and out through the material to an exhaust. This feature requires significant volumes of heated air. The invention of the Applicant does not

require that the heated gas be directed through the support substrate from the bottom or from any particular direction. Air can be directed from the sides, the bottom or from the top of the granular support substrate providing significant control over the drying conditions that is not available from fluid beds known in the art.

Secondly, there is no teaching, suggestion or motivation to replace the blowers of Oates with the jet engine of Lockwood because to do so would render the Oates apparatus unsatisfactory for its intended purpose and would change the principle of operation of the Oates apparatus.

4. The Combination Would Change A Principle Of Operation

There is no incentive, suggestion or motivation to make the combination of Lockwood and Oates articulated by the Examiner because it would change "the principle of operation of the prior art invention being modified." MPEP §2143.01 (VI.)

As discussed above, the fluid bed type of machines as shown in Oates require a minimum threshold air flow rate in order to function i.e. put the particles in motion and suspended in the air streams. Not only is there a minimum airflow requirement, there is a maximum airflow limitation as well. If the maximum airflow limitation is exceeded, the fluid bed is not created and the material to be dried is blown out into the exhaust. The fluid bed uses mechanical agitation and evaporation to dehydrate.

In contrast, the Lockwood patent uses a pulsed jet engine to create heat and gas flow as well as high decibel noise directed to a rotating drum within a chamber. The Lockwood patent teaches the use of *sonic* waves and pulsed gas flows to dehydrate. At Col. 5, lines 63-65 of Lockwood, the sonic waves are described as being on "the order of several cycles to several thousand cycles per second..." and "resonate the particles at their natural frequencies..." (Ultrasound, claimed by the Applicant, has a minimum frequency greater than or equal to 20,000 cycles per second and presumably in excess of the "natural frequencies" of the particles. Therefore, Lockwood does not disclose, and actually teaches away from the use of ultrasonic frequencies.) The Lockwood apparatus uses high intensity sound and high airflow rates to shear the

moisture from the particle. (Col. 5, lines 61-67). It can be seen that the "proposed modification" of the substitution of the jet engine of Lockwood for the heaters and blowers of Oates would "change the principle of operation" of the fluid bed and therefore "the teachings are not sufficient to render the claims prima facie obvious." MPEP§2143.01 (VI.)

5. The Combination Would Render Change A Principle Reference Unsatisfactory For Its Intended Purpose

There is no teaching, suggestion or motivation to replace the blowers of Oates with the jet engine of Lockwood because to do so would render the Oates apparatus unsatisfactory for its intended purpose. The Applicant submits that the jet engine of Lockwood is *not* the functional equivalent of the heaters and blowers of Oates. The proposed modification of Oates would preclude the Oates fluid bed from functioning and therefore incompatible with the cycling air structure of Oates. The high velocity, high temperature gas emissions of the Lockwood jet engine would blow the food particles out of the baskets 74 of Oates because it would exceed the maximum airflow allowable by the structure and what is necessary to form a fluid bed. Furthermore, there is no incentive or motivation to substitute the jet engine of Lockwood for the heat source of Oates because the emissions of the jet engine exceeds the "safe temperature" of the particles and therefore the source must be used with a rotating drum. At Col. 6, lines 23-33 of Lockwood it states: "Most...food products have an empirically defined 'safe' temperature above which the risk of damage or scorching ...with a conventional hot gas source becomes unacceptable. If the particles are not tumbled, the temperature must be further limited, because the first particles to contact the hot gases tend to scorch and burn,...unless the temperature of the pulsating hot gas is relatively low..." Accordingly, there is no incentive to make the combination of either Oates or Scott with Lockwood because the material would scorch and burn because of the exhaust temperatures and the absence of a rotating drum in the proposed combination.

In addition, there is no incentive, motivation or suggestion, for substituting the burners 30 of Oates or Scott with the jet engine of Lockwood because the structure of Oates would not allow the combination to function. The volume of gases emerging from the jet engine into the Oates structure, for example, would create a back-pressure in chamber 28 of Oates and interfere with or prohibit the flow of air through the perforated conveyor belt. Consequently, no cycling airflow can take place and the fluid bed function of Oates or Lockwood would not occur. Also, the stated benefits of the pulsed gas emissions from the jet engine and the sonic noise would be negated by the structure of Oates. Accordingly, there is no incentive, suggestion or motivation for the combination of Oates and Lockwood found in either patent.

In response to the previous arguments about the combination of Oates and Lockwood proposed by the Examiner, the Examiner states: "...the test for obviousness is not whether the features of the secondary reference may be bodily incorporated into the structure of the primary reference...Rather it is what the combined teachings of the references would have suggested to those of ordinary skill in the art." The Applicant respectfully disagrees because motivation to combine is provided by the hindsight of the Examiner rather than the reference and the proposed combination would require substantial design modifications. The proposed modifications of the structure of the primary and secondary references are relevant to the analysis of "obviousness." The case of *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) is illustrative. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.). See MPEP §2143.01 (VI.) Similarly, MPEP2143.01 (III) states, "...Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.)."

Therefore, the Applicant respectfully submits that the combination does not render the invention obvious and that there is no suggestion, motivation or incentive found in either Lockwood or Oates to make the combination and the rejection under Section 103 should be withdrawn.

B. **Rejection of Claims 31-33, 38-39, 59-61, 69-70, 73-74 and 77-79 under 35 U.S.C. § 103(a) Scott in view of Lockwood**

Claims 31-33, 38-39, 59-61, 69-74 and 76-79 were rejected under 35 U.S.C. § 103(a) as being obvious over *Scott* (U.S. No. 4,419,834) in view of *Lockwood* (U.S. No. 4,334,366). Scott discloses a stationary perforated table where heated air is forced through the perforations. Endless chains separated by vanes are used to move the material across the perforated table. The Scott fluid bed apparatus is similar to that of Oates. Consequently, the Applicant respectfully submits that none of the combinations suggested by the Examiner render obvious the invention of the Applicant as claimed since all of the elements and limitations of the invention are not shown in the proposed combination with Scott for the same reasons incorporated by reference.

Obviousness under Section 103 will generally not be found if the combination does not function as disclosed, substantial modifications have to be made, or the combination does not have all of the elements recited in the claims. Therefore, the Applicant respectfully requests that the rejection of Claims 31-33, 38-39, 59-61, 69-74 and 76-79 under 35 U.S.C. § 103(a) be withdrawn.

C. **Rejection of Claims 31-33, 38-39, 59-61, 69-70, 73-74 and 77-79 under 35 U.S.C. § 103(a) Scott or Oates in view of Lockwood and Ware**

Claims 35, 36-37 and 80 were rejected under 35 U.S.C. § 103(a) as being obvious over *Scott* (U.S. No. 4,419,834) or *Oates* (U.S. No. 3,214, 844) in view of *Lockwood* (U.S. No. 4,334,366) and further in view of *Ware* (U.S. No. 5,522,156) owned by the Applicant.

As described above, there is no incentive to combine either Oates or Scott and

Lockwood because of the different characteristics of the Jet engine and heating units (air flow volume, temperatures and noise). Generally, there is no incentive, suggestion or motivation to substitute the pulsed jet engine of Lockwood for the conventional burners and blowers of Scott or Oates because the volume of exhaust gas and heat created by the jet engine would exceed the safe temperatures causing the material to be scorched, and would exceed the pressures that can be accommodated be the small housing 61 of FIG. 2 of Scott for example. Such excessive temperatures and pressures produced by the jet engine would not permit the Oates or Scott fluid bed to function as designed and would blow the material away from the perforated table and into the exhaust parts of the structure of the apparatus. The pulsed jet engine is configured for use with a revolving perforated drum with the material enclosed within and is not adaptable to a fluid table or perforated belt without substantial modifications and structural changes if at all. (See MPEP §2143.01).

The addition of the Ware patent to the mix does not provide all of the limitations of the independent claims, and Claims 35, 36-37 and 80, and does not provide any incentive, suggestion or motivation to combine the sometimes incompatible elements of the cited patents.

Furthermore, the airflow volumes, velocities and temperatures that are necessary to make the fluid bed of Scott or Oates function are substantially greater than those disclosed and claimed by the Applicant. The substitution of the jet engine for the heater and blower of Oates would substantially *increase* the airflow and temperature conditions elevating the "granular support" substrate and setting them into motion. Therefore, the combination proposed by the Examiner would knock all of the material to be dried off of the spherical substrate during use thereby causing inconsistent drying conditions and the potential for burning the material to be dried.

A prime facie case of obviousness is not shown when the proposed combination does not have all of the limitations of the claims including ultrasound; there is not likelihood of success or there is no suggestion, incentive or motivation to make the

proposed combination found in the references themselves. The combinations proposed by the Examiner are deficient for the reasons discussed above and there is no suggestion, incentive or motivation in the references to substitute incompatible elements. Accordingly, the rejections based on Section 103(a) should be withdrawn.

4. Conclusion.

In view of the above, the new claims and each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

The Applicant also respectfully requests a telephone interview with the Examiner in the event that there are questions regarding this response, or if the next action on the merits is not an allowance of all pending claims.

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Respectfully submitted,

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